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SHORT COMMUNICATION

First report of kleptoparasitism in *Leptodeira rhombifera* (Squamata, Dipsadidae) for a yellow toad *Incilius luetkenii* (Anura, Bufonidae) in Nicaragua

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Abstract

Kleptoparasitism is a widely observed feeding strategy across various animal taxa. In snakes it is well documented in captivity, but rarely reported in the wild. This observation is the first of its kind in Nicaragua. This behavior may be more common in wild snake populations than previously thought.

Keywords

Competence, diet, feeding, predator, prey.

A feeding strategy defined as the deliberate theft of already acquired food is called kleptoparasitism (Broom and Ruxton 1998). Widely described in mammals, birds and invertebrates (Vollrath 1984; Iyengar 2008; Wood et al. 2015; Cusack et al. 2016).

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It can be intraspecific (Bringsøe and Dreyer 2024) or interspecific (McConchie and Wilkinson 2004; Platt et al. 2007).

The dipsadid genus *Leptodeira* is widely distributed in South and Central America including Nicaragua (Cadle 1984, 1985). In a taxonomic revision of the genus, *L. rhombifera* which will be dealt with here was recognized as a valid species (Barrio-Amorós 2019; Costa et al. 2022). We will maintain the specific status in this paper. These snakes, commonly known as Typical Cat-eyed Snakes (Midtgaard 2024) or just Cat-eyed Snakes, are important predators in their ecosystems (Savage 2002).

Incilius luetkenii is a species that reproduces explosively, with males rapidly changing from a cryptic brown color to a striking lemon yellow (Rehberg-Besler et al. 2015). This mating event generally coincides with the first rain of the year in their habitat (Doucet and Mennill 2010).

On July 1, 2010, between 8:10 p.m. and 10:10 p.m. during an ecological assessment at the Canopy tours Da Flying Frog locality in the coordinates 11°16'04" N, 85°51'57" W, 45 m a.s.l., southwestern Nicaragua (Fig. 1), MSS observed two individuals of *L.*

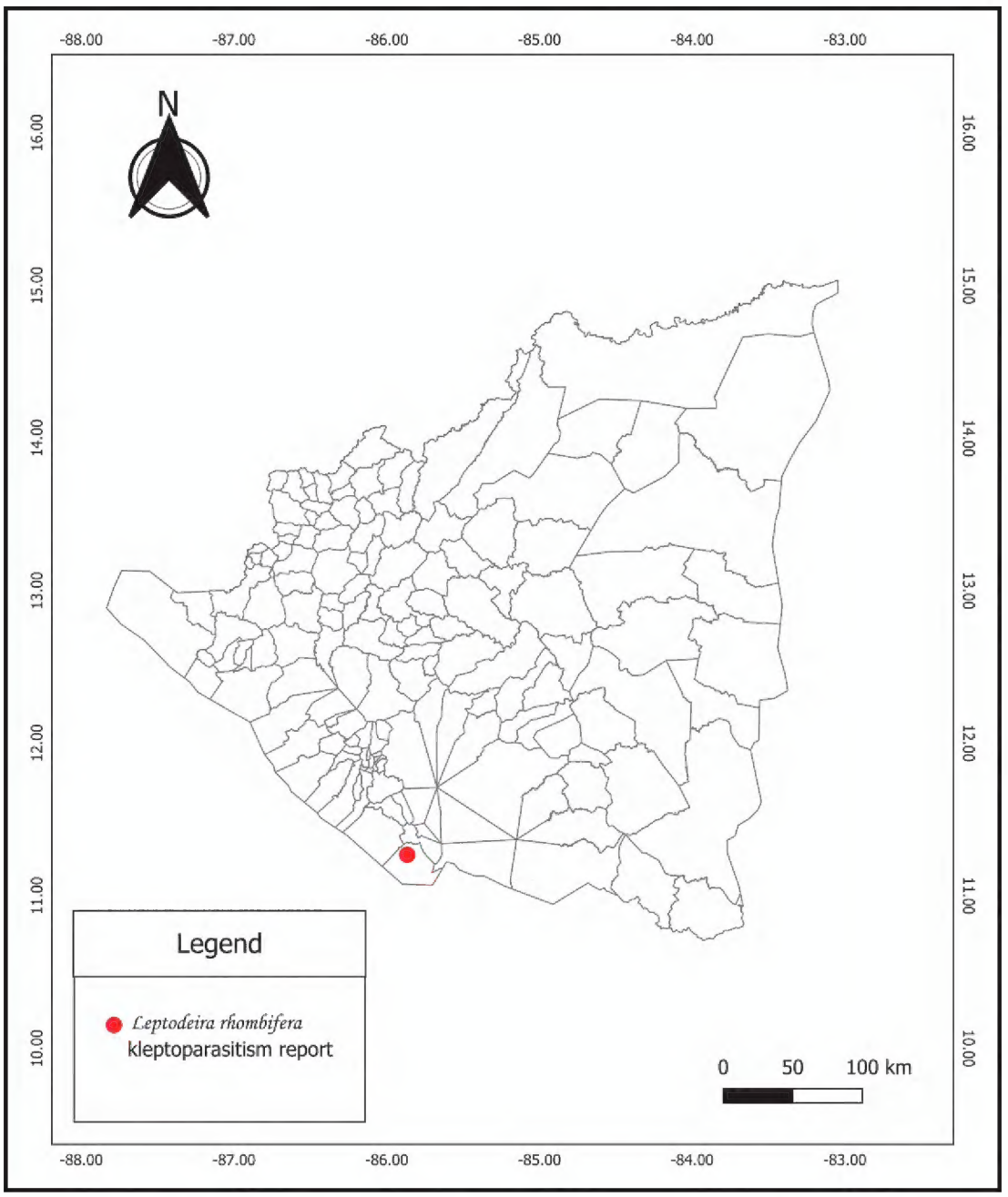

Figure 1. Map showing the location of the kleptoparasitism event in *L. rhombifera*

rhombifera in dispute to prey on a yellow toad *Incilius luetkenii*, the snakes held the toad by its ends, head and cloaca (Fig. 2B, C). The event lasted more than two hours.

The diet of *L. rhombifera* is varied, but mainly consists of amphibians whereas fish are eaten to a lesser degree (Duellman 1958; Céspedes and Abarca 2014; Solís and Guerrero 2016). In the genus *Leptodeira* in general, lizards are regularly recorded in the diet (Duellman 1958). In terms of bufonids, there are three reports of predation on *Rhinella horribilis* (Duellman 1958; Zug and Zug 1979; Solorzano 2004) and one case of necrophagy on *Incilius mazatlanensis* (Gamez-Duarte et al. 2024). Thus, we consider predation relationship between this species and *I. luetkenii* a normal event.

Kleptoparasitism in snakes has been widely documented in captivity, but sparsely in nature (Bringsøe and Dreyer 2024). These events can involve individuals of the same species (Platt et al. 2018) or interactions between species, including other conspecifics (Platt et al. 2020).

During the event, the secretion of a viscous mustard-yellow liquid was observed around the toad's parotid glands (Fig. 2D), which implies they were probably bufotoxins. After two hours of observing the event, MSS left the locality wherefore the outcome of the event remained unknown.

Platt et al. (2020) suggest that kleptoparasitism could be common in areas with high population density, especially by large individuals (Cooper and Pérez-Mellado

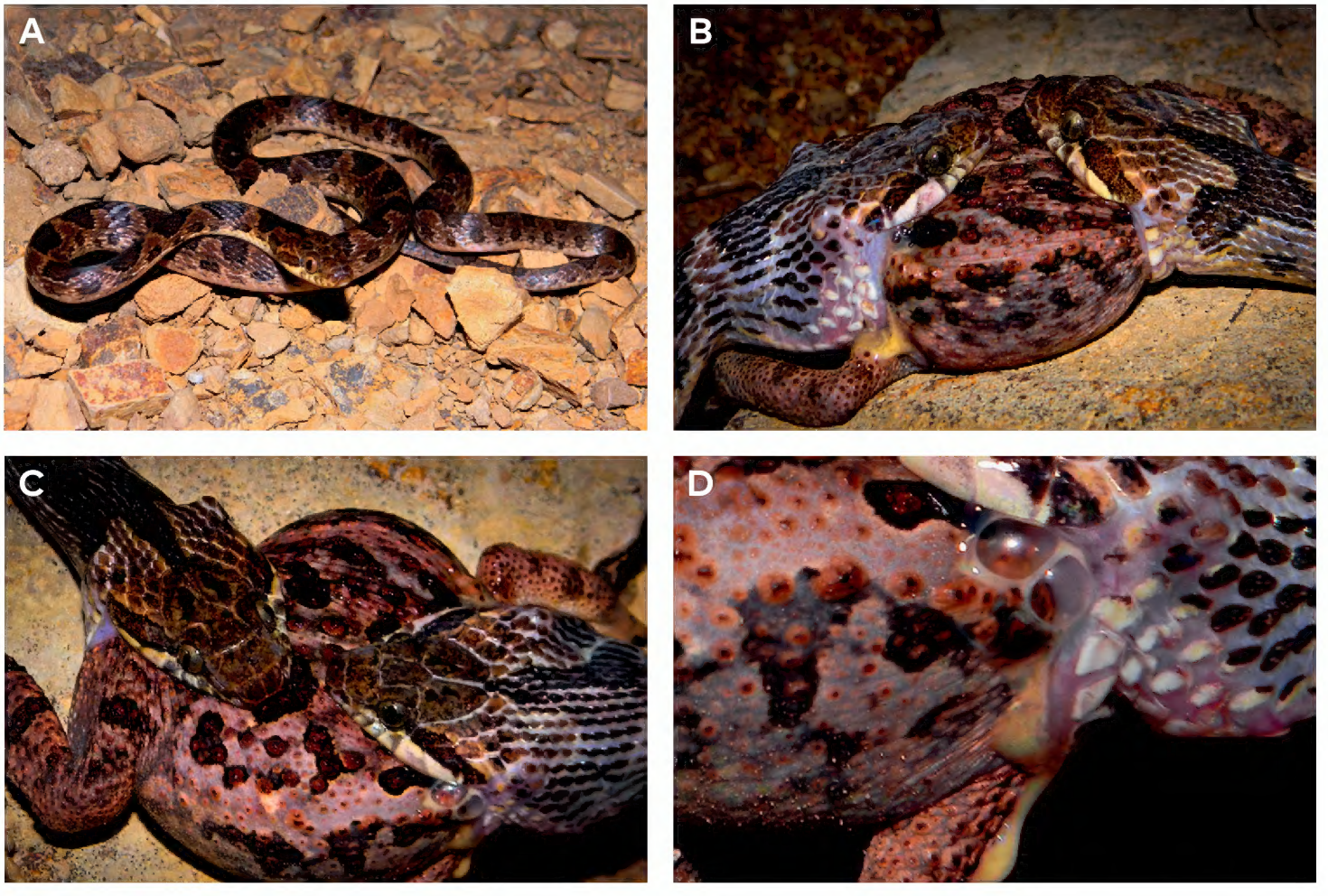

Figure 2. Kleptoparasitism event in *Leptodeira rhombifera*: **A** *L. rhombifera* individual located 10 meters from the event; **B** Lateral view of the left side of the toad; **C** Dorsal view; **D** Segregation of possible bufotoxins from the right side of the toad. Photos: Milton Salazar-Saavedra.

2003). Although rarely reported, this behavior likely occurs more frequently in the wild than previously thought (Bringsøe and Dreyer 2024), but this is the first record of kleptoparasitism among snakes of Nicaragua.

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